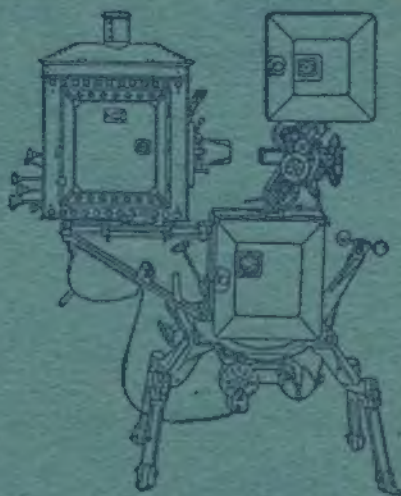


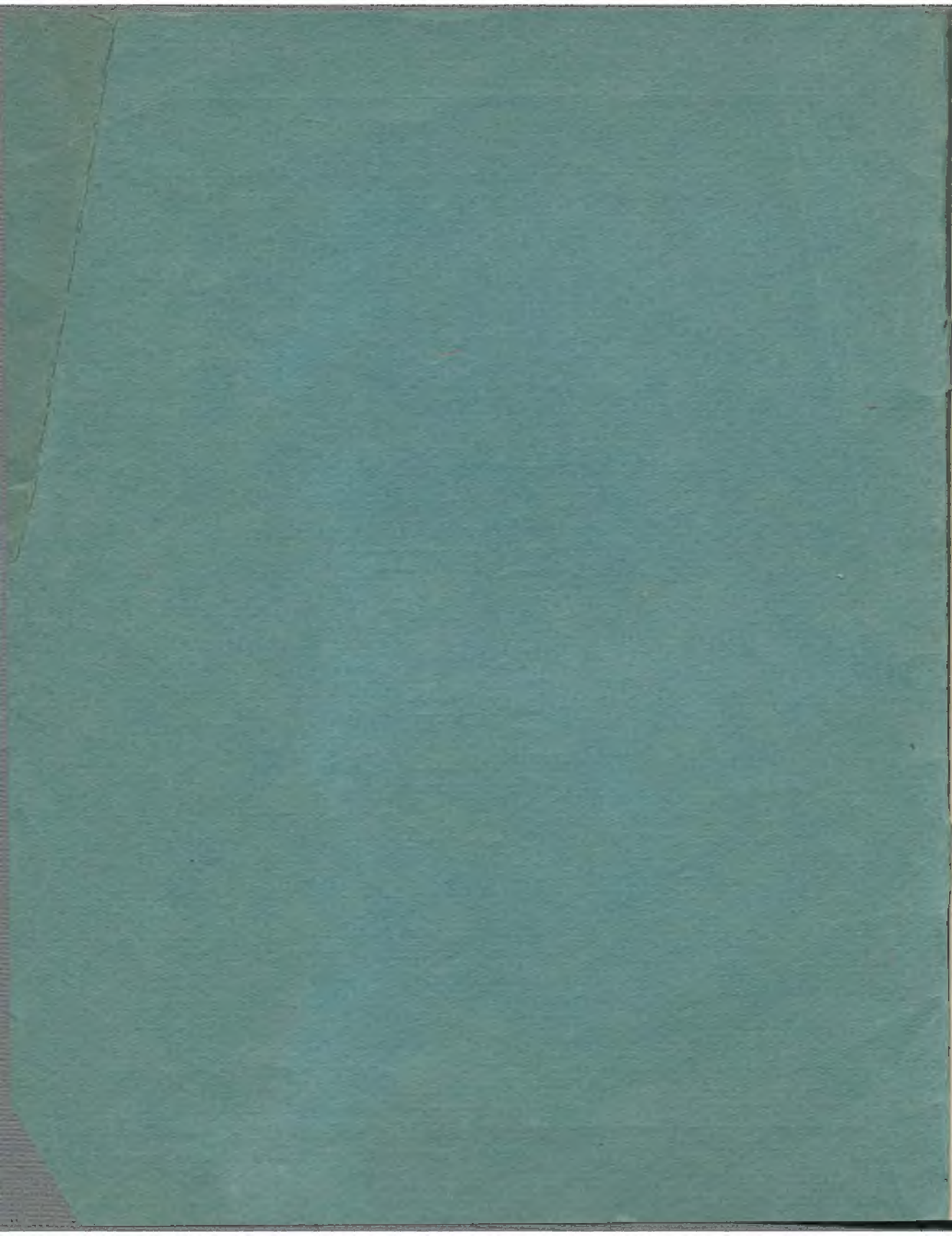
A BRIEF DESCRIPTION  
*of*  
Power's Projectors  
*and* Accessories



NICHOLAS POWER COMPANY  
INCORPORATED

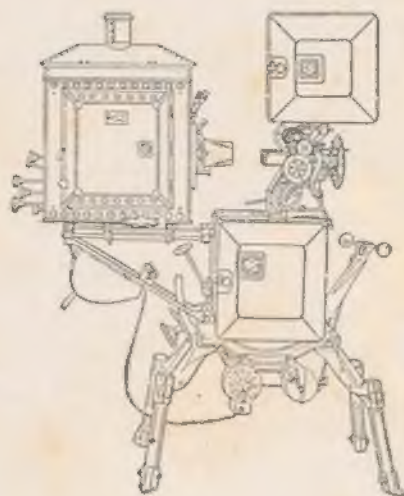
88-90 GOLD STREET

NEW YORK, U. S. A.





A BRIEF DESCRIPTION  
*of*  
**Power's Projectors**  
*and Accessories*



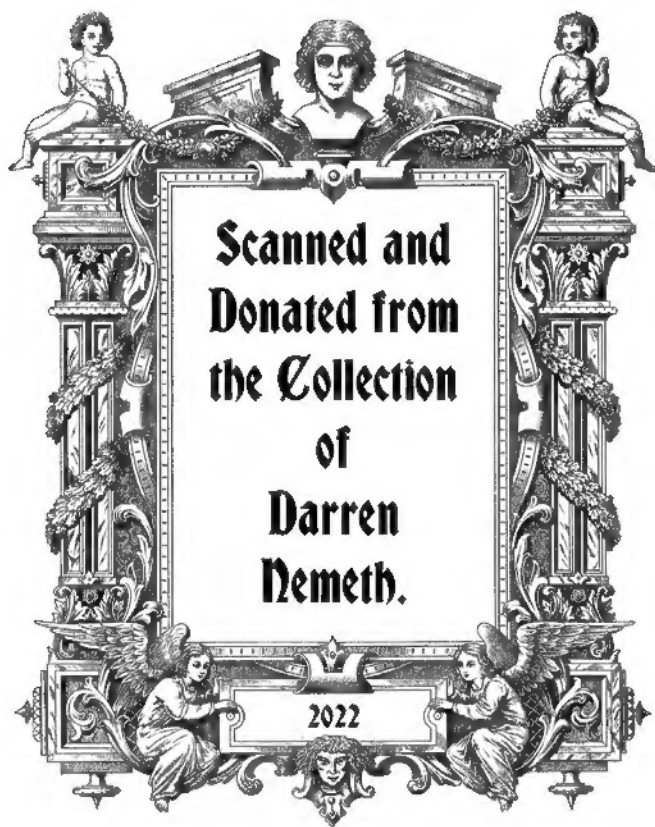
**NICHOLAS POWER COMPANY**  
INCORPORATED

88-90 GOLD STREET

NEW YORK, U. S. A.

CABLE ADDRESS: NICPOWER





## FOREWORD

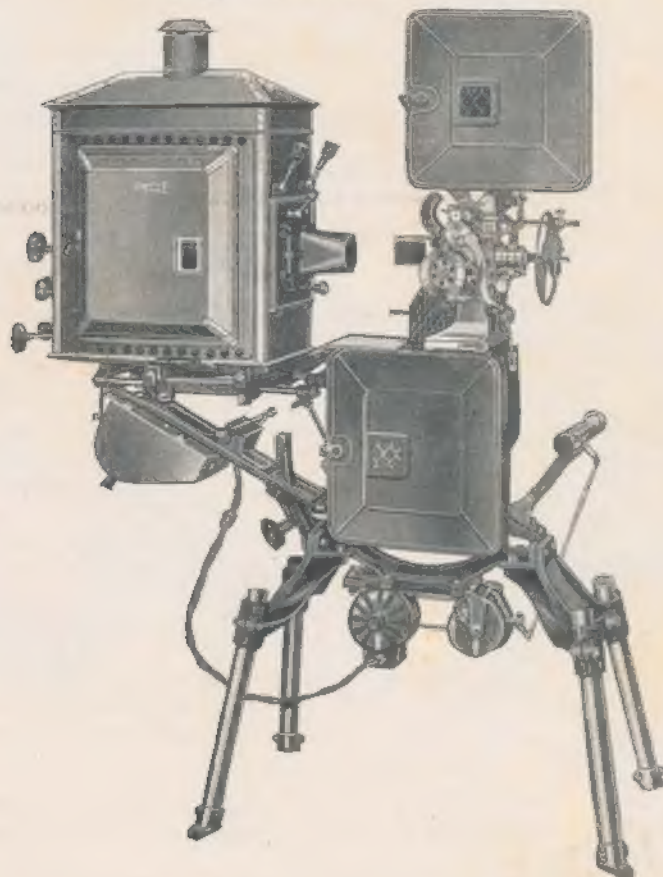
POWER'S Projectors have been on the market for over twenty-two years and are made by the oldest and largest manufacturers of motion picture machines in the world. During this period, Power's Projectors have been subjected to rigid practical tests in every part of the universe by important theatres, colleges, schools, churches, public and commercial institutions, and by the American Army and Navy.

Altho we make no attempt to compete in price with manufacturers of motion picture machines in other countries, Power's Projectors have frequently been selected, after competitive tests, by the governments and rulers of foreign countries.

Back of the great success of the Nicholas Power Company are certain definite reasons which can be concisely told and readily understood. With qualities giving Power's a basic mechanical superiority, we have continued to improve our machines without sacrificing dependability. It is the unchanging policy of the Nicholas Power Company to manufacture motion picture projectors which are durable and reliable and give a maximum of light in the picture with the greatest possible simplicity in operation.



*Power's "6B" Improved With Type "E"  
Lamp and Lamphouse*



**P**RACTICAL operation in many of America's leading theatres has conclusively demonstrated the reliability and general superiority of our newest and finest model, Power's "6B" Improved Projector.

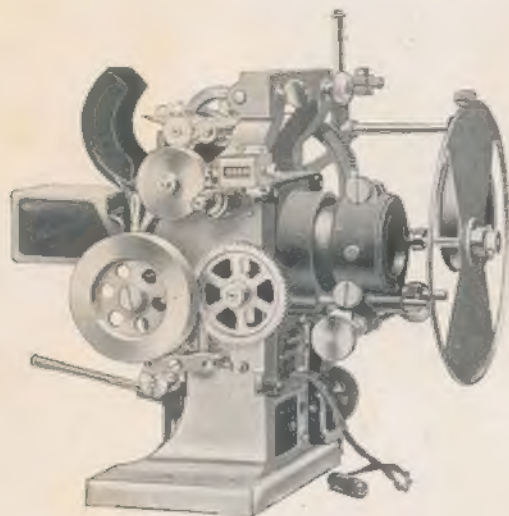
Workmanship and materials are always the best in every Power's mechanism and there is no difference in design or construction. "6B" Improved with Type "E" Lamp and Lamphouse, however, has special features which add to the projectionist's control of the machine and materially assist in securing better projection. The Improved model costs comparatively little more than the regular model and the additional advantages more than justify the difference in price. The special features furnished

with Power's "6B" Improved with Type "E" Lamp and Lamphouse would cost considerably more if purchased separately.

Power's "6B" Improved with Type "E" Lamp and Lamphouse has all the basic devices and exclusive features which have given Power's Projectors a leadership for many years, all the additions and refinements which are a part of Power's "6B" Regular and in addition several special features which are not supplied with any other model.

## Special Features Power's "6B" Improved

### *Power's Front Plate and Lens Mount*



**T**HIS new and improved front plate and lens mount has a rack and pinion adjustment with double focusing knobs so that the lens may be easily focused from either side of the projector. The front plate is a solid casting which provides a rigid support for the lens mount. A thumb screw securely locks the lens mount after the picture has been brought into accurate focus.

The mount proper consists of a split collar which is securely clamped by means of a set screw, thus holding the lens firmly in position. Adaptor rings can be supplied to hold any projection lens of standard diameter and lenses may be changed without difficulty or delay.

### *Framing Lamp*

All Power's improved projectors are supplied with a framing lamp mounted inside the mechanism in such a position that the projectionist may place his picture exactly in frame without trouble or delay.

### *Double Eye Shield*

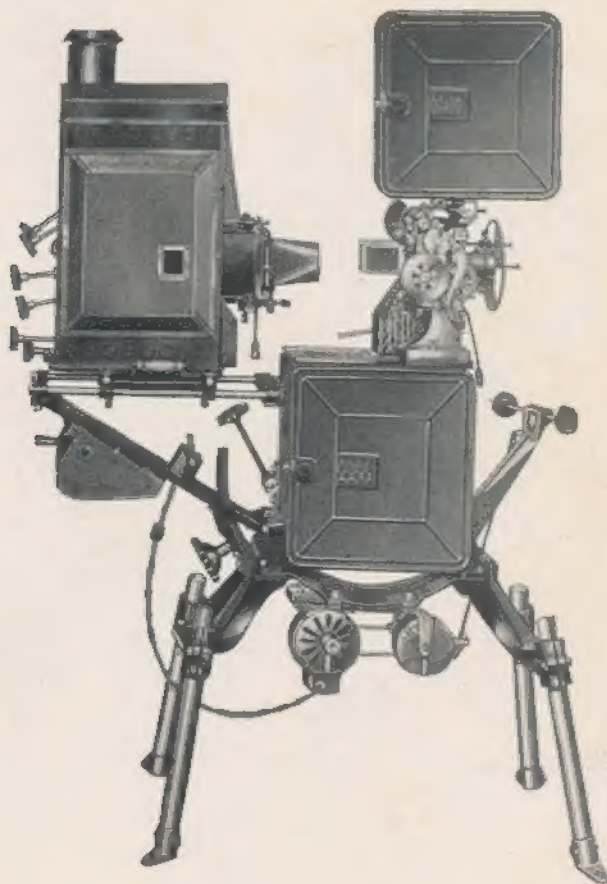
The two-sided ruby glass shield supplied with Power's "6B" improved covers the aperture and protects the projectionist from the blinding rays of light.

### *Film Footage Recorder*

The Recorder can be attached on the crank-side of any "6A" or "6B" mechanism, and when in position, engages directly with the crank shaft, thereby accurately registering every foot of film that passes thru the projector. If an accurate footage record is taken when the film is first run, the projectionist will then know to the foot exactly how much film is left upon the upper reel at any time and can arrange accordingly for the change-over.



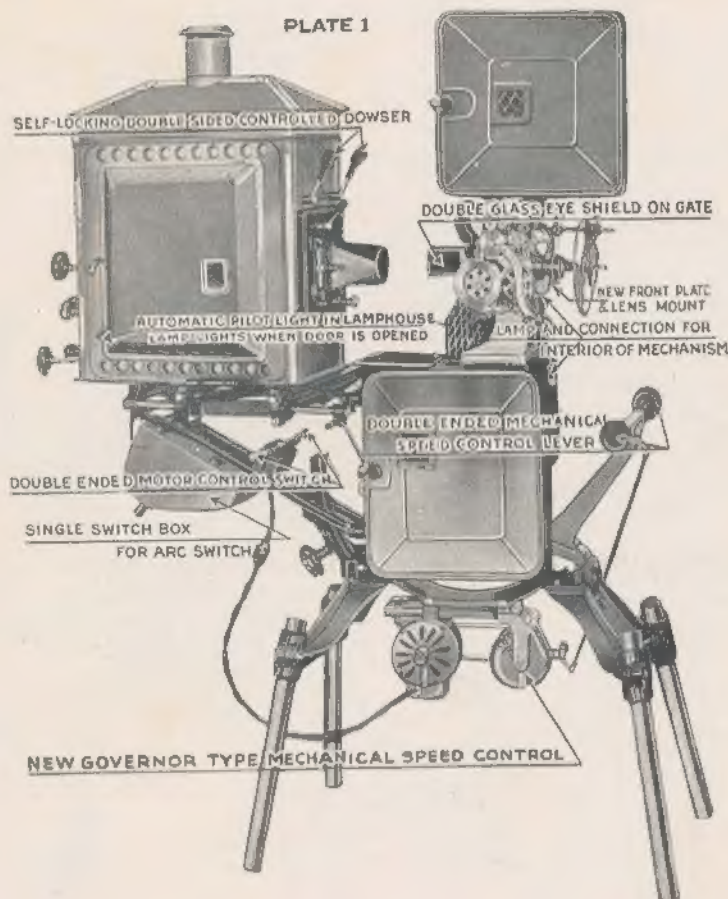
*Power's "6B" Improved*



**T**HE "6B" Improved is regularly listed with the "6B" Lamp and Lamphouse as shown herewith but the Type "E" Lamp and Lamphouse, Power's "G-E" High Intensity Arc Lamp or the Incandescent equipment can be furnished at a reasonable additional cost.

The length of the throw and the size of the screen usually determine the type of lamp and lamphouse to be used, but the proper equipment will also depend upon other conditions. All the lamp and lamphouse equipments mentioned are more fully described in other parts of this book, and little trouble should be found in determining which is best suited for a particular installation.

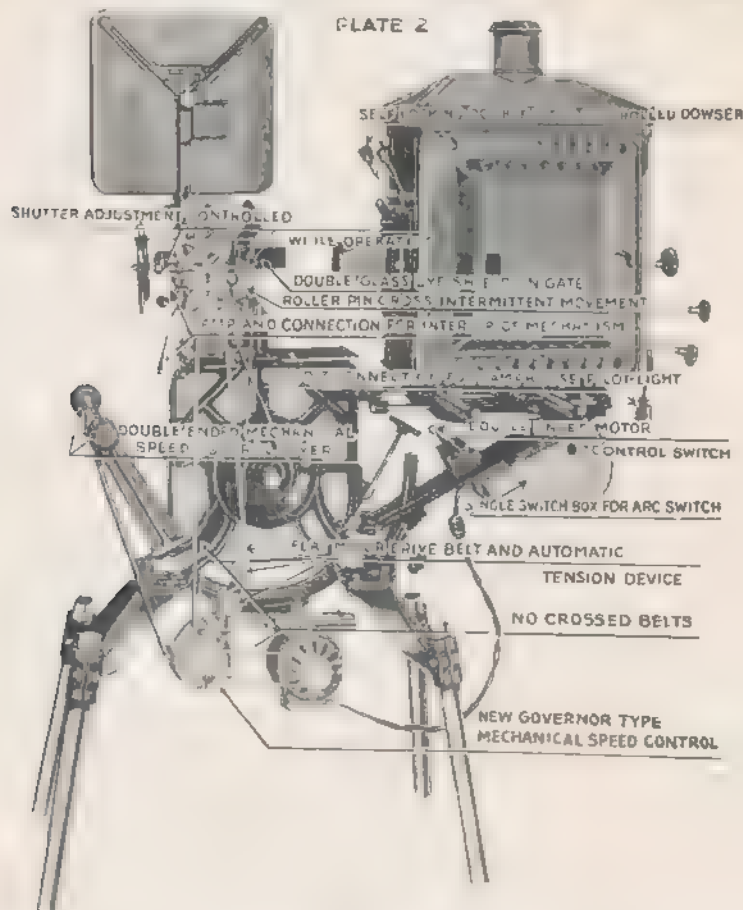
## Power's "6B" Improved Type "E" Equipment



### Equipment

- "6B" stand with 16" round cornered magazines.
- 100 ampere single arc switch and switch box mounted on stand beneath the lamphouse.
- Toggle switch for motor.
- Adjustable shutter bracket.
- Power's roller pin intermittent movement.
- "6B" Type "E" lamphouse complete with pilot light.
- "6B" Type "E" arc lamp complete.

*Power's "6B" Improved Type "E" Equipment*

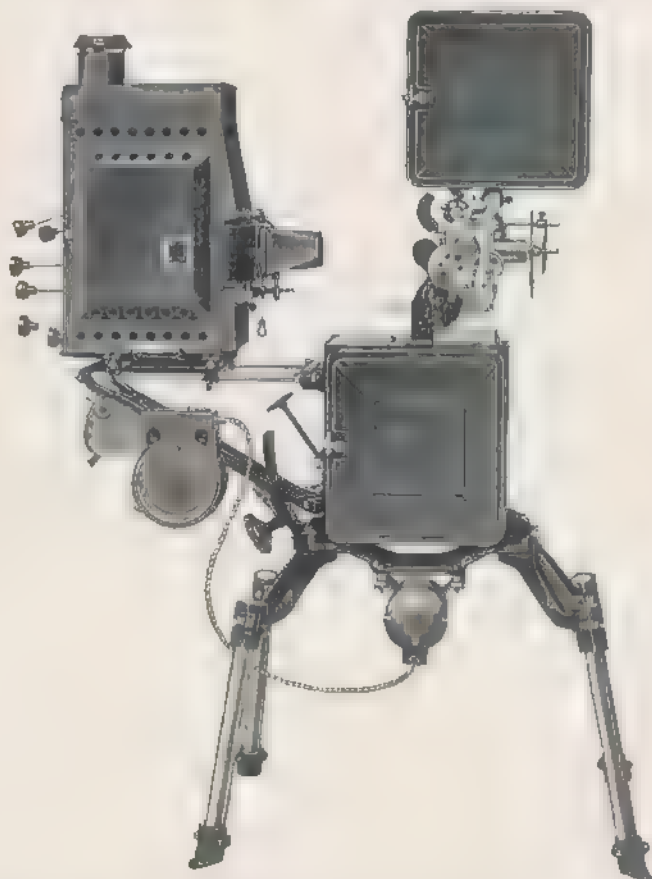


***Special Features***

Power's governor type speed control for D. C. or A. C. Motor, as specified.  
Speed control and motor attachment supplied with flat belt pulleys and flat belts.  
New style front plate and lens mount.  
Pilot light in mechanism.  
Film footage indicator.  
Double eye shield.  
Lenses: "Snaplite" No. 1 or quarter size and Power's new type stereo lens and mount to match.  
Half size "Snaplite" or quarter or half size Cinephor lenses will be supplied at a slight additional cost.



*Power's "6B" Regular Projector*

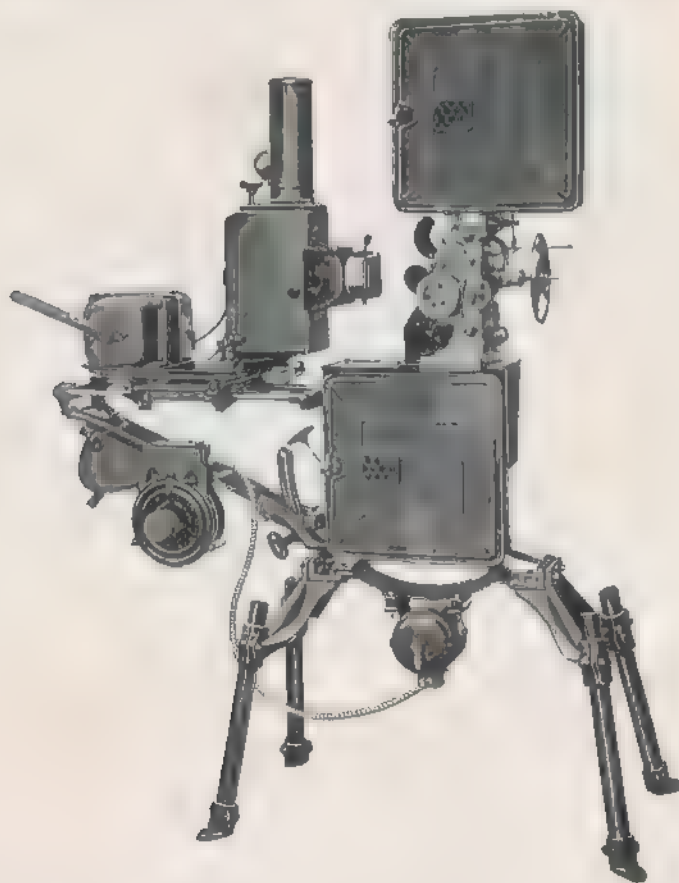


**P**OWER'S "6B" Regular is giving very satisfactory results in thousands of theatres throughout the country and its widespread popularity is a sufficient reason for giving it a place in this catalog. The quality of the materials and workmanship is exactly the same as that in the newer model but if first cost is not an important consideration we believe that Power's "6B" Improved will fully justify the moderate difference in price.

All the equipment listed on page 6 as part of Power's "6B" Improved are also a part of Power's "6B" Regular, but an additional charge is made for the special features of the improved model. Any of the special features may be purchased separately but if all are desired Power's "6B" Improved of course should be selected. We will be very glad to furnish quotation on any of the special features or on Power's Type "E" lamp and lamphouse, Power's G. E. high intensity arc lamp, or Power's Incandescent equipment which can also be supplied for Power's "6B" Regular.

NICHOLAS POWER COMPANY, Incorporated

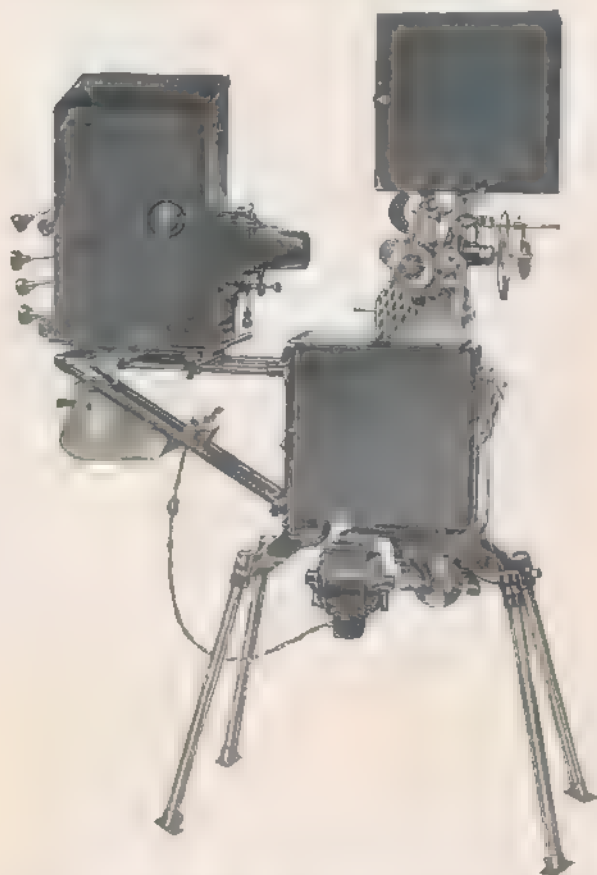
*Power's "6B" Regular  
With Power's "G-E" Incandescent Equipment*



**T**HIS is a splendid equipment for all theatres having a maximum main floor seating capacity of not more than one thousand, a picture not over fourteen feet wide and a throw not exceeding ninety feet. It is the most recent development of the General Electric Co. for Mazda and other incandescent lamps for motion picture projection, and under proper conditions it is an unqualified success.

Incandescent illumination, in addition to other advantages, has a soft, pleasing tone which brings up the depth of the picture and the rendition of colors is very satisfactory. Although the incandescent equipment demands the care of an experienced projectionist, its operation is comparatively simple and it is therefore strongly recommended for use in schools, churches and auditoriums. Another consideration of great importance is the relatively low amperage used on the incandescent equipment which avoids the necessity for heavy wiring.

### *Power's "6A" Projector*



**A**LTHO this is the smallest and lightest professional motion picture projector now on the market, the quality of the materials and workmanship in the mechanism is of the very best and exactly the same as in all Power's mechanisms. The stand is much lighter and the magazine is somewhat smaller, but the design and construction will be found adequate under all ordinary conditions. This model has been widely used and is in use in thousands of theatres, auditoriums, schools, colleges and public institutions. Power's "6A" was used almost exclusively in war work abroad and has been tried under all conditions in every part of the world. It can be specially recommended for traveling purposes and where an extremely light and practical motion picture machine is desired. It gives strictly professional results and will be found dependable in the most remote and isolated localities. For the requirements and conditions we have mentioned, Power's "6A" is absolutely without competition.



## *Power's Roller Pin Intermittent Movement*

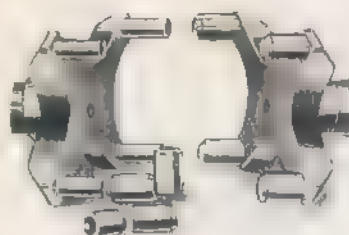


**W**HILE it is true, of course, that every part of any machine is indispensable or should be—some parts perform a more important function—and the intermittent movement has been called the "heart of the mechanism." If the film were projected to the screen uninterruptedly, there would be no effect of motion; there would be only a blur. To overcome this blur, the picture is stopped momentarily while it is being projected to the screen, then moved on to the next picture.

It is the function of the intermittent movement to move the picture in this way as rapidly as possible within certain practical limits, and to do this with the least possible strain upon the film.

The movement of Power's Intermittent is popularly known as a "Five to one movement" and is an exclusive feature of Power's Projectors. For many years it has won wide recognition as the fastest movement on any machine. The "Five to one movement" and some even faster have been used on other projectors, but the results have not been entirely satisfactory. Power's intermittent has been designed and constructed to permit the use of the fast movement without imposing undue strain upon the mechanism or film.

## *Power's Pin Cross Rollers*



**T**HIS is an exclusive feature of Power's Projectors and is one of the most important and successful improvements made on motion picture projectors in recent years. Power's pin cross rollers are small, movable sleeves which fit over the pins of the pin cross, and, acting as a roller bearing, reduce frictional wear and noise to a minimum. The pin cross rollers are made of specially selected steel, hardened and finished with the utmost care.

## *Power's Intermittent Movement*

### *Technical Description*

If the intermittent movement is given proper attention at regular intervals, it should give excellent service for at least a year and we have known instances where intermittents have given splendid results after two years operation.

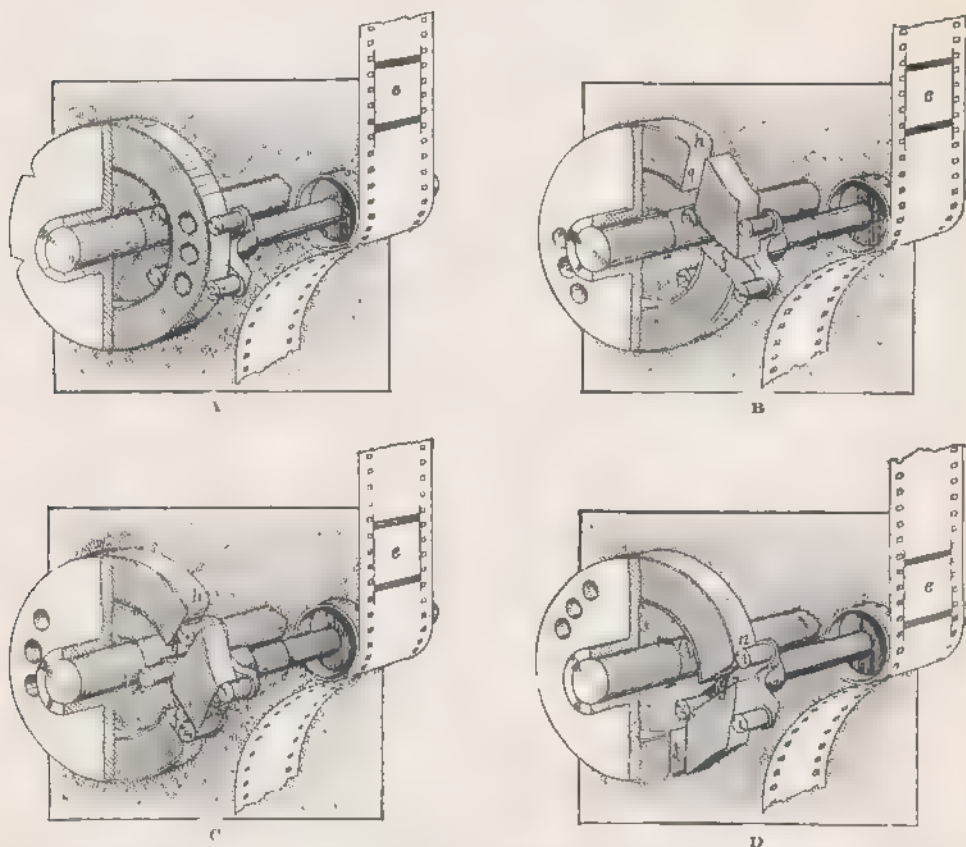
When an intermittent movement leaves the factory it is set up as close as practical but after being in use for about two weeks the intermittent pin cross should be set up close against the outside of the cam ring. This is done by turning the large eccentric bushing—UP A TRIFLE *never down*. After this no further adjustment is necessary for a period of several months, when the pin cross should be again set up against the cam ring.

The cam and pin cross are enclosed in an oil tight casing. An oil cup is fastened to this casing, and by keeping the parts plentifully supplied with a high grade lubricant, a practically noiseless operation of the Movement without perceptible wear on the parts, is assured.

Power's Intermittent Movement consists of four elements namely: a pin cross, a diamond shaped cam, a locking ring and a sprocket.

The four pins of the pin cross are formed from the end of a solid cylinder of steel accurately ground to receive the steel rollers. The remainder of the cylinder is turned down to the proper diameter to act as a spindle upon which the sprocket is securely fastened.

The cam and locking ring are formed together on the face of a solid steel disc. A metal guide is securely fastened to the back of this disc extending outward from its entire circumference so that the four rollers are always held in position on the pins. The sprocket has two rows of teeth to mesh with the holes that are perforated on both edges of the film.



**D**RAWINGS A, B, C and D show Power's Intermittent Movement in action. A portion of the back of the cam-ring disc, and the entire metal guide have been cut away so as to expose the workings of the Movement during one revolution of the disc. The curved arrows indicate the direction in which the parts are revolving. The sprocket is in mesh with a short strip of film. Portion E of this film which lies between the heavy black cross lines, represents one of the photographic views to be projected upon the screen.

In figure A, the four pins of the pin cross are shown in engagement with the locking ring. Pins 1 and 2 are at the outer circumference and pins 3 and 4 are at the inner circumference of the ring. Although the ring is revolving, it cannot impart motion to the pin cross as the pins are securely locked by contact with the inner and outer surfaces of the ring; consequently the pin cross, the sprocket and the film are at rest. It is during this period of rest that the photographic view is being projected on the screen.



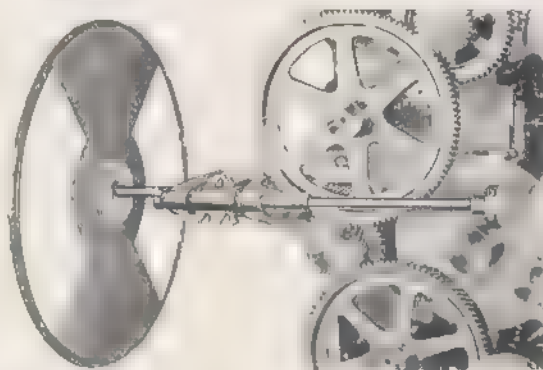
In figure B, the pins are disengaging from the locking ring. The cam is just starting to engage with pin 1. As the engagement takes place the pin is pushed forward and downward, thus imparting a rotary motion to the pin cross spindle. The sprocket, being fastened to this spindle rotates with it, thus pulling the film downward.

In figure C, pin 1 has almost reached the apex of the cam. Pin 2 is travelling into slot F, pin 3 is describing an arc in the space between the ends of the locking ring, and pin 4 is travelling out of slot G. As pin 1 passes over the apex of the cam, pin 4 engages with the curved surface H at the end of the locking ring and the pin is thrown forward and upward until it slides on to the outer surface of the locking ring.

In figure D pin 4 has just reached the outer surface of the ring. The four pins are immediately locked as the locking ring travels into the space between them. In contrast to the pin positions in figure A, pins 1 and 4 are now at the outer circumference and pins 2 and 3 are at the inner circumference of the locking ring. It can readily be seen that the pin cross spindle has made a quarter revolution, and that view E has been drawn downward a corresponding distance.

These pins can only move in the path of a circle. As pins 2 and 4 travel through their respective slots although it would appear that the pins must travel in a straight line. This, however, is not the case. The fact that the cam ring disc is revolving, constantly changes the position of these slots so that their straight lines intersect the circular path of the pins at successively different points.

### *Shutter Adjusting Device*



All mechanisms are equipped with the shutter adjusting device which permits adjustment while projector is in operation. After the shutter has been set or timed in the usual way it sometimes happens that a finer adjustment is required. The shutter adjusting device permits making the adjustment while the projector is running and under such conditions will prove of real advantage to the projectionist. Once the shutter is set, however, no further adjustment is required.

## *Power's Automatic Loopsetter*



factory and entirely practical.

Power's automatic loopsetter accomplishes the resetting of the lower loop by means of an automatic clutch arrangement which disengages the lower sprocket and take up from the driving gear. When the lower loop is lessened or lost, an idler roller and lever arm are elevated so as to disengage the clutch connecting the lower sprocket and take up pulley with the driving gear. This allows the lower sprocket and take up to rest just long enough to permit the re-forming of the lower loop which automatically effects the re-engagement of the lower sprocket and take up with the driving gear.

## *Lenses*



THE importance of suitable lenses can hardly be overestimated and those regularly supplied with Power's Projectors are well known standard makes such as Snaplite and Gundlach. Bausch & Lomb Cinephor lenses may be had at a moderate advance in cost.

We recommend No. 2 Lens for all focal lengths for which this size lens is made, as it will transmit approximately double the amount of light passed by No. 1 Lens.

To regard the projection lens as a mere detail is to minimize its importance, and we suggest that when selecting this part of the equipment, the matter be gone into carefully with us or the dealer from

whom Power's Projectors are purchased. The Bausch & Lomb Optical Company, Rochester, New York, and the manufacturers of the other lenses mentioned issue literature which will be of interest and value to all those selecting equipment for projection of motion pictures.

## ***Power's "6B" Stand***

**T**HE stand, which is exactly the same for all "6B" models, is exceptionally substantial and entirely original in design. The "6B" base is made in two sections, the lower part with its four legs of solid construction setting in sockets which can be attached to the floor. The motor drive is solidly bolted to the underside of the lower section and remains horizontal.

The upper section carries the mechanism, magazines and lamphouse, and this section is designed to permit tilting in a vertical plane to get the necessary angle from the projection room to screen. By means of heavy bolts passing thru slots, both sections are securely held to give positive rigidity once the proper angle is secured. A very fine and accurate angular adjustment is obtained by means of a worm thread. The adjustment is also easily accessible and permits centering of the picture on the screen during operation. This is a highly important feature of "6B" models.

The upper magazine is equipped with a newly designed revolving spindle upon which the reel is held by a key. A simple friction device prevents the reel from revolving due to its own momentum, thus maintaining an even tension on the film at all times.

The double switch box supplied on earlier models of Power's Projector has been discontinued. In its place a separate motor switch has been installed which may be controlled from either side of the machine. The arc switch is now mounted directly underneath the lamphouse so that it may be operated from either side of the machine.

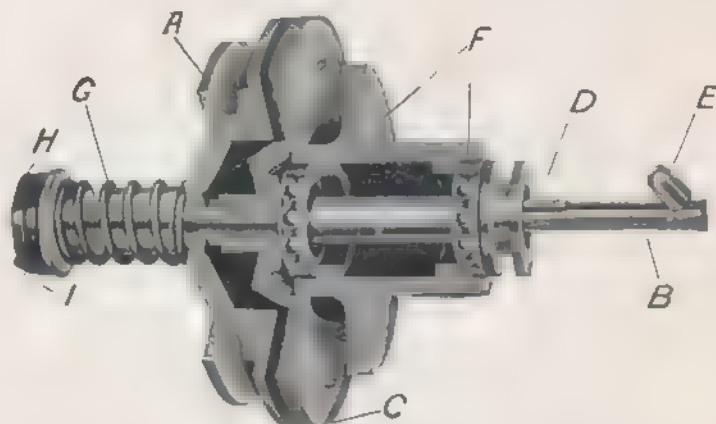
The motor speed control lever furnished with all motors is double ended on all machines supplied with mechanical speed controls and is also accessible from either side of the projector. The old style round motor drive belt has been replaced with a 1 1/2" flat endless belt. When it becomes necessary to tilt the machine the lengthening and shortening of the motor drive belt is compensated for by means of an automatic belt tightening device attached to the governor type speed control base on the improved projector and to the stand on the regular model. Details of the mechanical speed control will be found on Pages 18 and 19.

## ***Power's Magazines***

The corners of the square magazine provide ample space for the fingers to enter and firmly grasp the reel of film while being placed in the magazine or taken out. It frequently happens that there is no space between the outer circumference of an overfull reel of film and the inner circumference of a round magazine, and what should prove a very simple operation often becomes a rather disagreeable task. The new round cornered magazines are more attractive in appearance, and the corners have the necessary space for the entrance of the fingers which entirely overcomes the trouble found with round magazines.



## *Power's Ball Bearing Take-up*



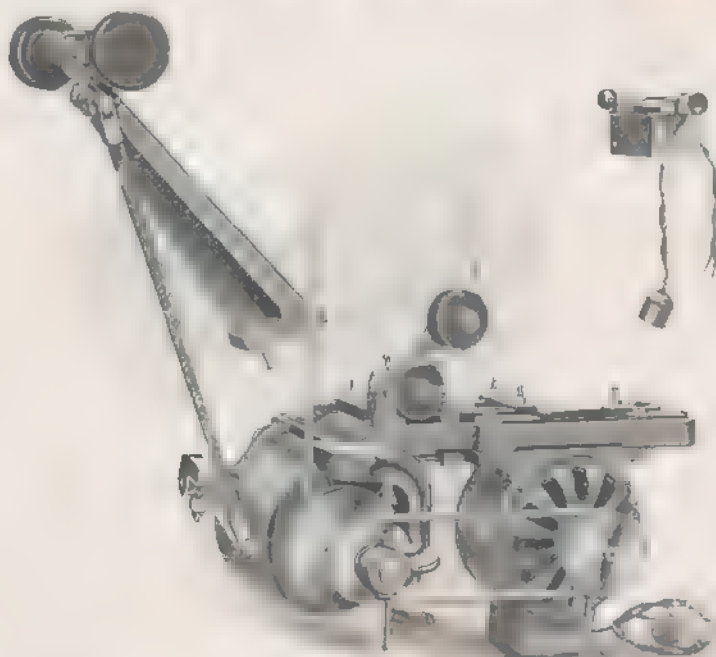
**T**HE importance of the Take up device should not be overlooked as its primary function is to make proper compensation for the ever changing size of the film as it winds up on the reel in the lower magazine. Power's Ball Bearing Take up has been a part of Power's Projectors for a number of years and has proven absolutely dependable and efficient.

The Take-up consists primarily of two friction discs, which are held in contact by means of a spring. One of these discs is faced with fibre, which assures an excellent frictional contact. The driving disc (a) is left free to revolve around Take up spindle (b), as an axis. The driven disc (c), is fastened to spindle (b). By frictional contact, motion is transmitted from disc (a) to disc (c), and thus spindle (b) is caused to revolve also. The Take-up reel fastens to spindle (b) at (d). The reel is held firmly on the spindle by means of catch (e). When the catch is in a horizontal position, it is in exact line with spindle (b), thus making it very easy to put the reel on, or take it off the spindle. Spindle (b) runs in ball bearings (f), which eliminate all unnecessary friction in operation.

As the film winds on the reel the steadily increasing diameter gradually retards the speed at which disc (c) revolves, and this automatically regulates the speed of the Take-up reel, so that at every moment the proper tension on the film is assured.

The friction between discs (a) and (c) may be adjusted by increasing or decreasing the tension on spring (g). This may be accomplished by simply giving a few turns in either direction, to collar (h), which is threaded on the end of spindle (b). When the desired tension has been secured, the collar may be locked in place by means of set screw (i).

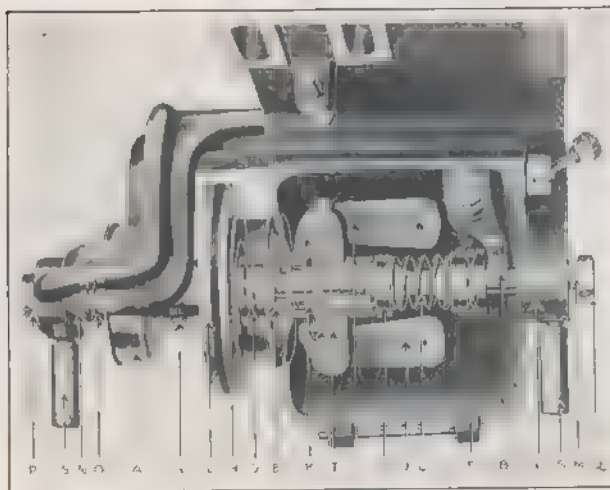
*Power's Governor Type Mechanical Speed Control*



THE application of the governor principle to speed controls is an important mechanical advance and Power's governor type mechanical speed control has eliminated several serious troubles heretofore found in all speed controls. Absolute accuracy and dependability are secured and after fifteen months practical operation in many of the country's leading theatres we have not had a complaint or criticism.

By setting the lever of Power's governor type mechanical speed control and then simply throwing in the motor switch, the projector will at once reach the exact speed for which the control is adjusted. If Power's speed indicator is used in connection with the new control, all difficulty regarding the proper timing of the picture is eliminated. By referring to the dial of the indicator and making the necessary adjustment to the regulation of the control, the picture may be projected at so many feet per minute or to take a given number of minutes per thousand feet.

All moving parts revolve upon one common shaft which in turn is free to rotate in its bearings so that the least possible amount of friction is present in any part of the apparatus. Another important feature of this control will prove of great value to communities troubled with fluctuating voltage as a drop of line voltage should not affect the speed of the mechanism even tho the motor should slow down considerably.



**Governor  
Type  
Mechanical  
Speed  
Control**

**Technical Description**

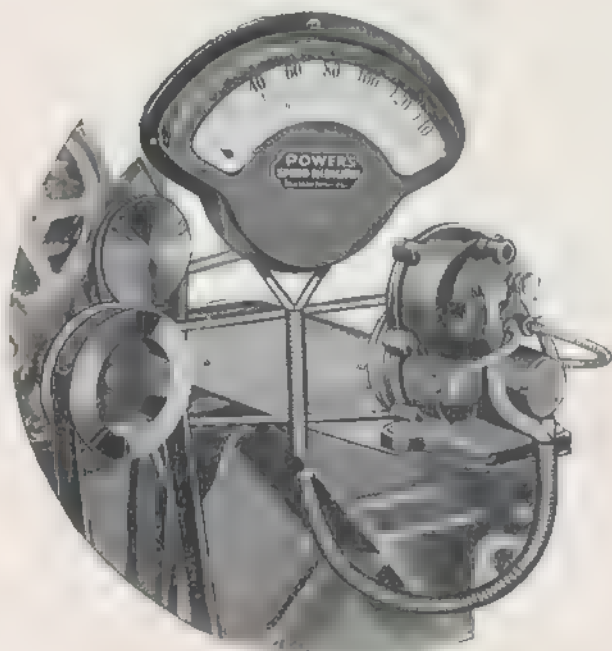
**T**HE action of Power's Governor Type Speed Control will be more clearly understood by referring to the lettered drawing.

The pulley A is belted directly to the motor shaft and is therefore constantly rotated at full maximum speed when motor switch is closed. If there is no tension applied to the control lever the balance of the apparatus will remain stationary. If, however, the control lever is so adjusted as to apply pressure to compression fork B the tension spring C will apply pressure thru thrust bearing F and coupling fork D to disc H, bringing discs L and H into tight contact with each other. The instant this contact is formed the entire control will begin to revolve and governor weights I, J will be thrown outward thereby causing a slight additional pressure on tension spring C applied from point K which tends to separate discs H, L. It is this counter-pressure which permits the variation in speed between these two discs, and the greater the pressure applied at B the faster will the entire control operate, up to the point where the governor ceases to exert any counterpressure against fork B, at which time the driving element A and the driven elements H, E, K, I, J, D and C will all operate at maximum speed.

All moving parts are free to rotate on shaft M, and excessive friction on bearing N is prevented by thrust bearing O. End thrust between disc L and coupling fork E is reduced to a minimum by thrust bearing G.

The entire control is readily disassembled by removing either collar P or Q, when the shaft may be pulled out from either end and the moving parts caught in the hand. Prior to the introduction of Power's new speed control great difficulty had been found in keeping oil from reaching the parts of the control. It is not necessary, however, to keep oil from reaching parts of Power's governor type mechanical speed control as it will operate just as efficiently when bathed in oil as when dry, in fact, a little oil between the discs will be found beneficial.

## *Power's Speed Indicator*



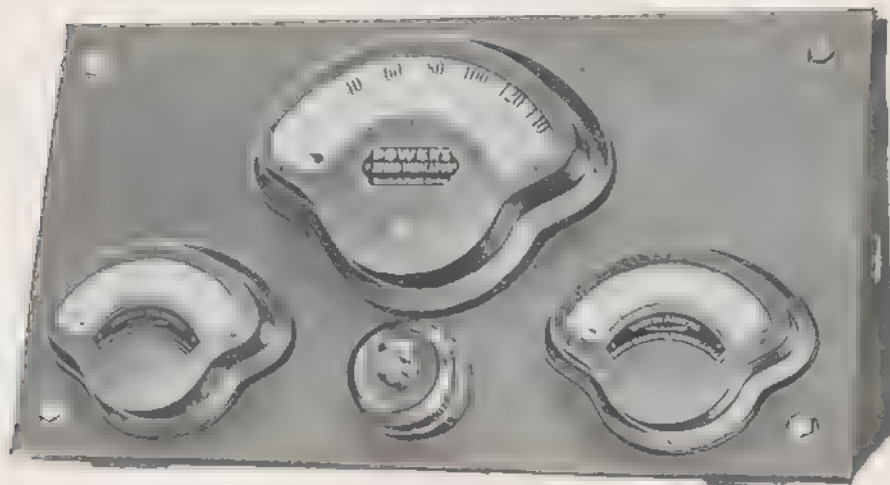
**A** SCIENTIFICALLY designed and accurately constructed instrument which shows at a glance the speed at which the projector is operating and the exact film footage passing thru the machine in a given time.

Indicators may be placed at any number of points desired and the musical director and projectionist will have no trouble in closely following the program and time schedule.

Power's Speed Indicator Equipment consists of a high grade magneto generator which is connected by suitable wiring with one or more exceedingly accurate indicating instruments having scales, calibrated, to show the speed of the film in feet per minute and minutes per thousand feet. Other types of scales will be supplied at a slight additional cost. The generator is driven by belt from the motor attachment pulley on the mechanism.



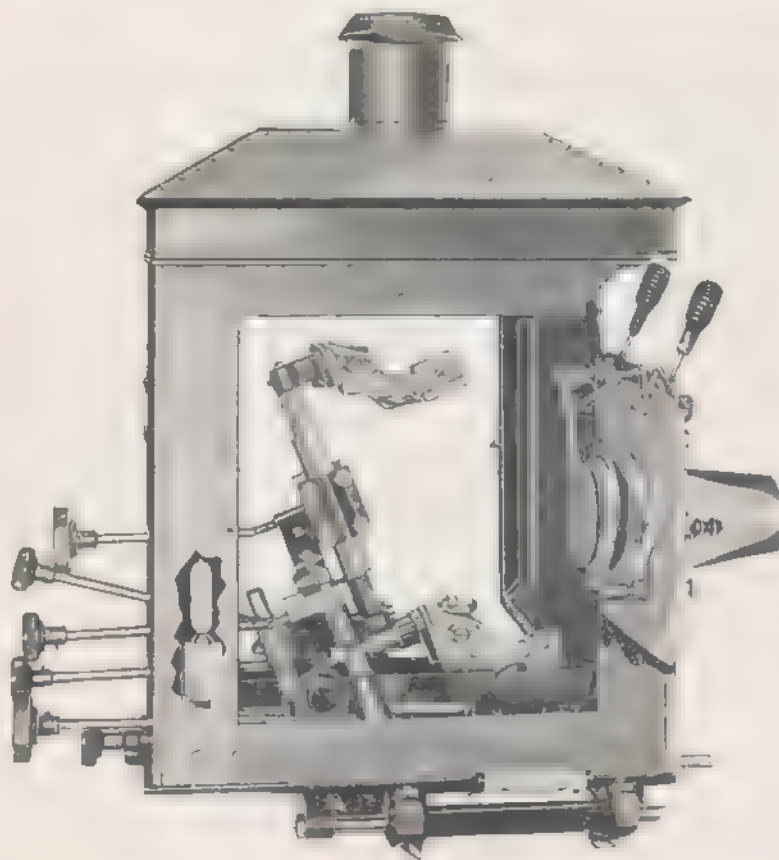
### *Power's Instrument Panel*



ONE of these panels, mounted on the wall in front of each projector will enable the projectionist to carefully watch the current and voltage regulation of the arc and the speed of the mechanism.

The equipment consists of a nicely finished black slate panel, a metal panel box, one voltmeter reading Arc Voltage and one ammeter reading to 150 amperes. Space is provided on each panel for one speed indicating instrument as described under "Power's Speed Indicator." A special automatic relay is also provided inside the panel box which automatically opens the voltmeter circuit when the arc is not burning. This device allows the use of a lower scale voltmeter which permits more accurate readings of arc voltages when the arc is burning. High grade Weston instruments are supplied with this equipment.

*Power's Type "E" Lamp and Lamphouse*



**P**OWER'S lamps and lamphouses have won recognition as the most serviceable and dependable manufactured and we present our latest equipment, confident in the knowledge that it will meet every requirement of modern projection where the regular arc lamp is used.

Power's Type "E" Lamp and Lamphouse equipment has been subjected to all the rigid tests of the National Board of Fire Underwriters and has met all these requirements without difficulty.

### *Power's Type "E" Lamphouse*

**S**UBSTANTIAL stamped sheet metal is used in the construction of the type "E" lamphouse which is made in our own factory. The lamphouse is built extra large in size in order that the protectionist may gain easy access to its interior and make any adjustment without removing the lamp. Two openings have been provided in the front of the lamphouse in order that it may be easily cleaned. It is designed so that its ventilation is scientifically correct and the extra large area prevents over-heating with arcs of high amperage.

The dowser is of heavy gray iron and is placed inside the lamphouse to protect the condensers from the flame and sudden heat when striking the arc.

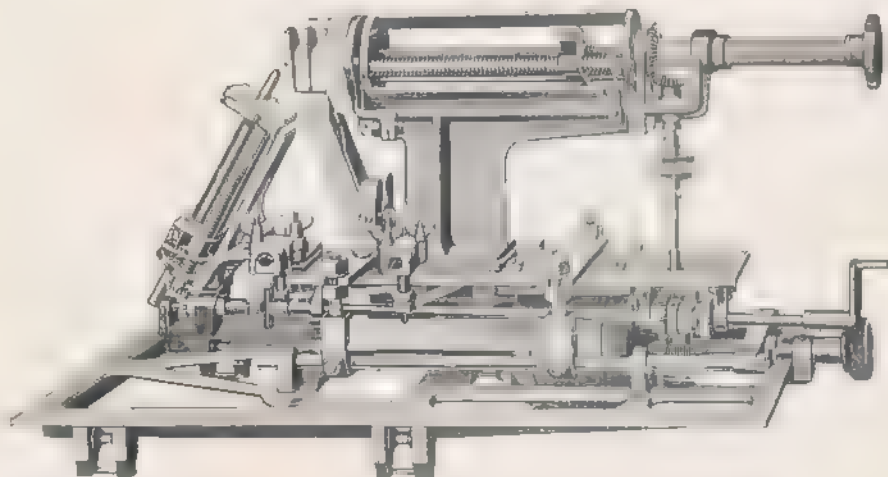
In order that condensers may be easily cleaned, the condenser mounts are supported on a strong gray iron frame hinged to the lamphouse to open outwardly, thereby bringing the condensers and their mounts entirely clear of the lamphouse. The condenser holders are made of extra heavy gray iron to insure a perfect alignment of the condensers, and to hold them securely in place they have been made with a "V" shaped edge which fits securely into a "V" groove on the condenser mount. The rear condenser, the one nearest to the arc, is adjustable from the outside of the lamphouse to permit spacing the condensers the proper distance apart.

### *Power's Type "E" Lamp*

**T**HE lamp is built sufficiently heavy thruout to take care of any necessary amount of current, and its principal features are as follows:

1. The upper carbon holder is designed to accommodate carbons of sizes from  $\frac{1}{8}$ " to  $1\frac{1}{4}$ " inclusive. The lower carbon holder accommodates carbons of sizes  $\frac{1}{16}$ " to  $\frac{3}{8}$ " inclusive and the clamps being "V" shaped assure a rigid hold on the carbons without breaking them.
2. Both upper and lower carbon holders are equipped with a clamp designed to take the place of lugs on the wire. The clamps are made with a series of interlocking corrugations on both top and bottom so that when the wire is clamped between them, a perfect connection is made. To prevent arcing, both the clamp and carbon holder are made of one piece of metal.
3. Both the lateral backward and forward adjustments are made on the lower carbon, so that when adjusting the arc, the position of the crater remains unchanged.
4. Additional rigidity is given by the use of a worm wheel and gear for raising and lowering the lamp.
5. The rack rods are made of heavy square bars held with a spring cover, to give them greater wearing surface and to amply take care of expansion. This feature also prevents the rack bars binding when subjected to the intense heat of the arc.

*Power's "G-E" High Intensity Arc Lamp*



POWER'S "G-E" lamp produces upon the screen over one hundred percent more light per ampere than the ordinary arc lamp, and is undoubtedly today the foremost development in the motion picture projection field. High intensity illumination, as at present understood, is based upon foreign researches and inventions known as the Beck patents taken over and developed for search-light during the war by the General Electric Company. This illumination was so satisfactory the General Electric Company and the Nicholas Power Company have now developed the Power's "G-E" High Intensity Arc Lamp for Motion Picture Projection, and this has proved highly successful after over fifteen months practical operation in a large number of representative American theatres.

Power's "G-E" High Intensity Arc Lamp is a radical departure from the ordinary arc lamp. The intensity of the illumination and the quality of light developed are the result of several novel mechanical features incorporated in the new lamp and the chemical nature and the construction of the core and wall of the high intensity carbon.

A reference to the accompanying cut shows the general appearance of the high intensity lamp. The center of the core of the positive carbon is exactly on the optical axis of the projection equipment, while the negative carbon is set at an angle of about 55 degrees to it.



## *Power's "G-E" High Intensity Arc Lamp*

### *General Description*

**T**HE mechanical design of the high intensity lamp permits the maximum amount of light to be gathered by the condensers and this means a considerable saving in the cost of current consumption. While in some instances this might not be the most important consideration, it must be understood that if the same amount of light were desired from the ordinary arc lamp, this would be difficult without great additional expense, and the quality of the light absolutely depends upon the proper use of the high intensity lamp and high intensity carbon.

The positive (upper) carbon is 18" long and uncoated, and the negative (lower) carbon is 9" long and metal coated. If the normal rated operating current were carried thru the entire length of the positive carbon, it would be overloaded and taper away thru its entire length. This is prevented by means of an ingenious arrangement of floating contact clamps which feed the current to that part of the positive carbon immediately behind the arc itself. The negative carbon, being metal coated, can carry the full current thru its entire length. The current in the negative carbon is therefore conducted directly to the negative carbon clamp.

The positive carbon holder revolves upon the optical axis of the projector and the crater is at all times a perfect circle presenting a very small but exceedingly brilliant surface head on to the condensing lenses. The negative and positive carbons are both cored, and each has a different chemical composition in the core. As the current is fed into the high intensity carbons, a cup-shaped crater is formed and a combination of gases emitted and burned at an exceedingly high temperature which develops the brilliant and splendid quality of the high intensity light.

Power's "G-E" High Intensity Arc Lamp is absolutely automatic once the arc is struck, which means that the lamp embodies its own arc control, and this is also a radical advance in arc lamp construction. Once properly set in the lamphouse, the only adjustment required is the forward and backward movement of the entire lamp by means of which the size of the spot at the aperture is controlled.

Replacing carbons in the lamp is a very simple operation as it is merely necessary to slip them into place and tighten screw in the carbon clamps. The terminals of the lamp are the same type as those used in the Power's Type "F" lamp and there is an absolute assurance of a positive connection between the wire and the current carrying part of the lamp. There is no danger whatever of the wires burning loose from the terminals.

## ***Power's "G-E" High Intensity Arc Lamps Current Ratings***

Power's "G-E" High Intensity arc lamps can be supplied for three current ratings as follows:

45 to 55 ampere lamp (50 to 55 volts, using 9mm. positive carbon and  $11\frac{1}{2}$  ends of an inch negative carbon) admirably adapted to smaller theatres desiring the best possible projection, but where conditions do not warrant the use of a 70 to 80 ampere lamp.

70 to 80 ampere lamp (55 to 60 volts, using 11 mm. positive carbon and  $3\frac{1}{2}$ ths of an inch negative carbon) suitable for the most of the first class moving picture theatres in the larger cities.

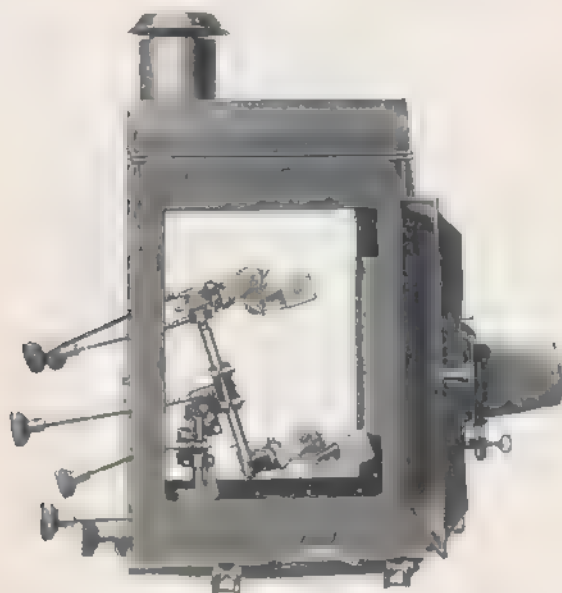
95 to 125 ampere lamp (60 to 70 volts, using 13.6 mm. positive carbon and  $7\frac{1}{4}$ ths of an inch negative carbon) for houses having an unusually long throw and an extremely large picture.

It is impossible to advise as to the proper size lamp for any particular theatre, but we are always pleased to recommend the most suitable equipment if full details are submitted to us. Our engineering department will furnish blue prints and all other information necessary to insure the proper equipment.

To attempt to operate these lamps with a greater current variation than the maximum or minimum for the carbon sizes as stated above would mean a great sacrifice in efficiency. It is therefore absolutely necessary to change the carbon diameters to secure satisfactory results when using different amperages.

In order to use the different size carbons it is necessary to change the positive and negative carbon clamps, negative pigtail connection with terminals, the positive contact shoes and the positive and negative guide plates. These parts can be easily changed and with the exception of the parts mentioned, the balance of the lamp is identical for amperages from 45 to 125.

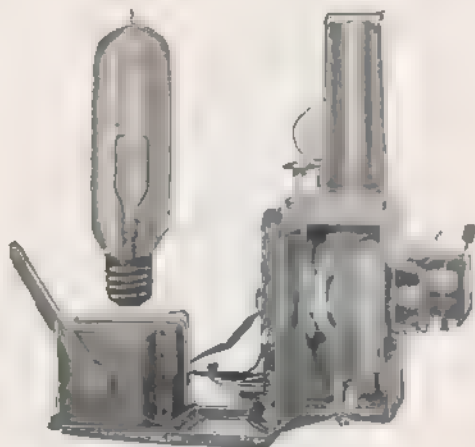
## *Power's "6B" Lamphouse*



**T**HIS equipment can be supplied for Power's "6B" improved or regular projectors, and is strongly recommended for buildings in which the size of the screen or length of throw do not demand the Type "E" or High Intensity equipment. Power's "6B" lamp and lamphouse have given splendid service for a number of years in thousands of first class theatres and are designed and built with the same care given to all equipment manufactured by this company.

The "6B" lamphouse is amply ventilated by means of a partition extending from the rear end to within three inches of the front end. The heat and gasses from the arc must pass directly thru the flue formed by this partition to the four inch diameter flue in the top near the rear end. Two air flues under and over the condenser mount, extending an inch beyond the front wall of the lamphouse, provide additional ventilation to reduce heat at the condensers. The lamphouse doors have double walls with ventilated air space between them. The inside of the front wall of the lamphouse is protected by asbestos shielding to reduce the amount of heat transmitted to the condenser mount. Mica shields protect the square colored glass peep holes in each door. Improved latches fall readily into position upon closing the doors and composition handles are used which absorb very little heat.

## *Power's "G-E" Incandescent Equipment*



**T**HE complete equipment which includes the current regulator and lamphousing forms a compact unit and replaces the regular Power's Lamp and Lamphouse. The special lens holder is attached so that the prismatic condenser lens used for motion picture projection can be instantly shifted and replaced by a set of plano condenser lenses for stereopticon use. The housing itself is on a sliding base which enables it to be pushed over to one side when stereopticon projection is desired. The unusually long chimney affords the proper ventilation to the lamp. The small ammeter attached to the housing is placed where it can be easily watched.

As the lamp operates at 30 amperes and 28 to 30 volts it is necessary to have some form of current regulating device. For use with alternating current a hand control transformer permits gradual application of voltage to the lamp, thus preventing an initial surge of current thru the filament, which would have a very harmful effect. When the filament is cold, the resistance is very low, but as the wire becomes hotter the resistance increases, accompanied by expansion. If the rated voltage were applied to the cold lamp, the heating and expansion would take place almost instantly and cause the filament to become distorted and in some instances short-circuited. The combined use of the adjustable transformer and ammeter further facilitates the accurate control of the amperes in the lamp.

It has been the practice in many cases on direct current to use an adjustable resistance for control, but owing to the high wattage consumed, this method of regulating is very uneconomical. A small synchronous converter which also has a special hand operated transformer as an auxiliary, can be supplied, and this gives far better service as it is much more efficient.



## *Power's Automatic Transformer*



**P**OWER'S Automatic Transformer has been especially designed for use in connection with Power's incandescent equipment and in addition to automatically maintaining a fixed amperage, also protects the filament of the lamp from sudden shocks when throwing in the switch. With the ordinary transformer an excess amount of amperage is sometimes delivered to the filament which reduces the life of the lamp and in other instances the amperage is inadequate, which affects the brilliancy of the illumination. Adjustments by means of the hand lever are necessary to overcome these defects and frequently the results are unsatisfactory.

Power's Automatic Transformer, a new departure in Transformer design, maintains the amperage for which the apparatus is designed, regardless of fluctuations in line voltage. The operation of the automatic transformer is as follows: The weight of a primary coil is counterbalanced by a counterweight mounted on a ball bearing spindle. This movable system of primary coil and counterweight is so nicely balanced that the slightest variation in line voltage is accompanied by proper compensation in the value of the current delivered to a secondary coil. When the switch is thrown in on the primary side, the movable coil instantly travels the furthest distance from the fixed coil, allowing a small amount of current to flow through the lamp and slightly heat it up. A rebound, which from a practical standpoint may be said to be instantaneous, occurs when the movable coil has reached the upper limit of its travel. After several oscillations, the movable coil finally comes to rest in such a position that it allows the proper current flow in the lamp filament regardless of variations of the line voltage impressed on the primary terminals.

The transformer is designed for operation on line voltages from 80 to 140 and will give constant automatic regulation throughout this range. When operating under normal conditions, the transformer will draw about fifteen amps from the line.

The apparatus is substantially constructed, the coils being thoroughly impregnated with the best insulating varnish. The inside of the casing is lined with asbestos which eliminates the noise resulting from the vibration present to some extent in all types of transformers. No perceptible heat is given off by the transformer as it is designed to secure ventilation by means of a natural draught through the apparatus.

### ***"Nupower" Motor***

**T**HIS motor, furnished exclusively with Power's Projectors, is a new departure in motor design, and has a number of special features which make its use highly advisable under certain conditions. The Nupower is a universal motor and can be used on D.C. or any cycle A.C. It is therefore particularly adapted for installations in small towns or outlying districts where unusual current conditions would otherwise require specially designed motors.

The Nupower motor has a very wide range of speed variation, and excellent speed control is secured thru the use of an adjustable rheostat having a large number of contact points. This motor has been thoroly tested by us under varying conditions and is strongly recommended for use where the current available is not suited to the regular motor furnished with other types of speed control.

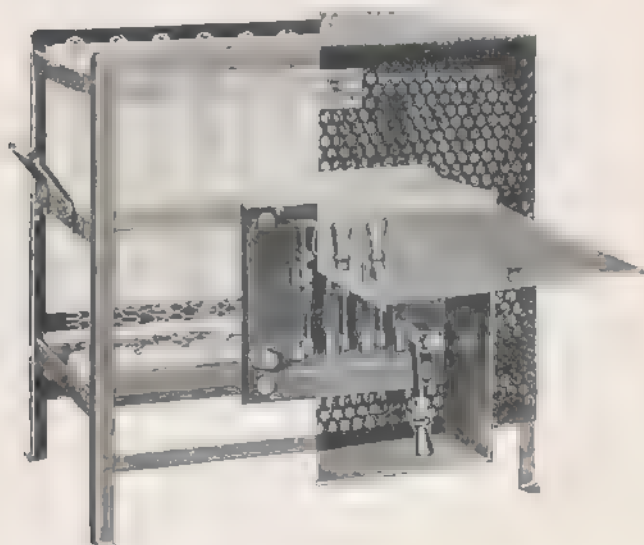


### ***Power's Inductor***

**T**HIS is a stepdown transformer, designed to secure maximum economy in current consumption where it is desired to operate the motion picture arc directly on alternating current.

Power's Inductors are made in two capacities, each provided with a three-way switch, reading High, Medium and Low. One size operates at 50, 60 or 65 amps while the other operates at 80, 85 or 90 amps. Power's Inductors are furnished for 110 volt and 220 volt in 25, 40, 50, 60 and 133 cycles. A strong iron casing affords protection to the windings and at the same time gives ample ventilation.

## *Power's Multiple Coil Rheostat*



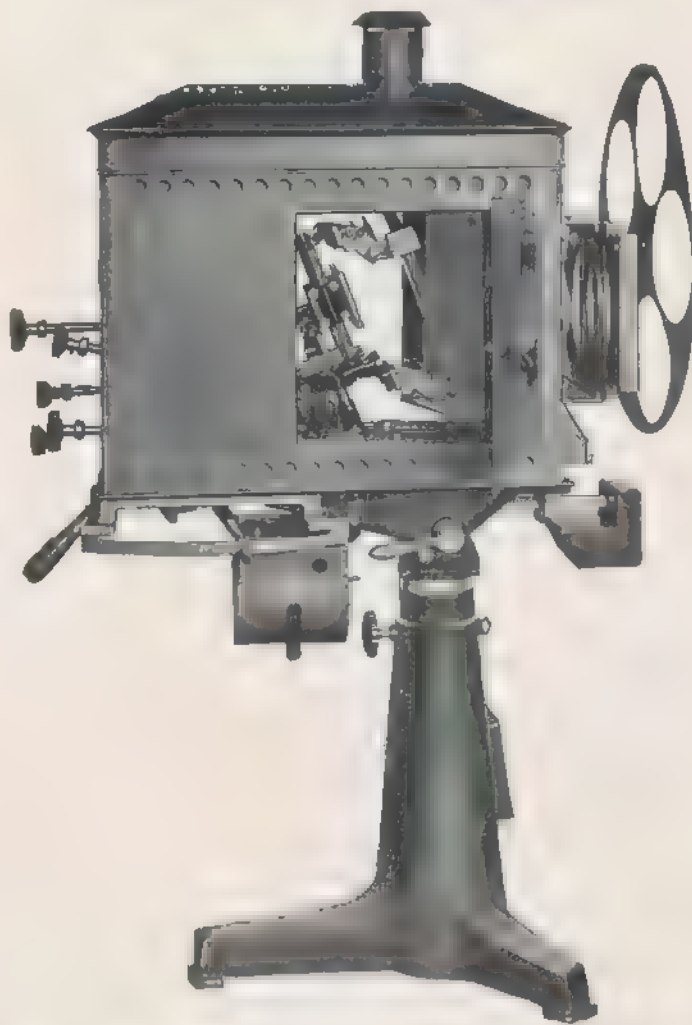
**T**HE multiple coil rheostat is so much superior to the grid rheostat we have discontinued manufacturing the latter. Power's multiple coil rheostat weighs less than  $\frac{1}{3}$  of the grid type rheostat and can easily be moved by one man. The multiple coil units are connected across two heavy brass bus bars, one coil carrying five amperes and the balance ten amperes each. The current carried thru the rheostat is easily varied in five or ten ampere steps by means of knife switches.

The loss of one coil does not affect the others and if entire capacity of rheostat is not being used, a new coil may be immediately switched in. Coils are of a special non-corrosive wire and may be replaced in a few minutes without difficulty. They are exceptionally strong and operate at an exceedingly low temperature. As each coil carries a low amperage (not more than 10 amps) a wire of very small cross-section is used which permits perfect connections to be made to bus bars.

Power's multiple coil rheostats are made in the following sizes.

30 - 55 amperes	110 - 115 volts
40 - 75 amperes	
60 - 95 amperes	or
80 - 125 amperes	220 - 230 volts

*Power's Type "E" Spotlight*



OUR object in designing and constructing Power's Type "E" Spotlight was to answer the demand for a spotlight superior to anything of a similar nature heretofore manufactured. While the price is not excessive, we frankly admit that economy was no part of our plan in designing this spotlight. Power's Type "E" Spotlight is unquestionably the finest spotlight on the market and the results secured with it will fully justify its cost.

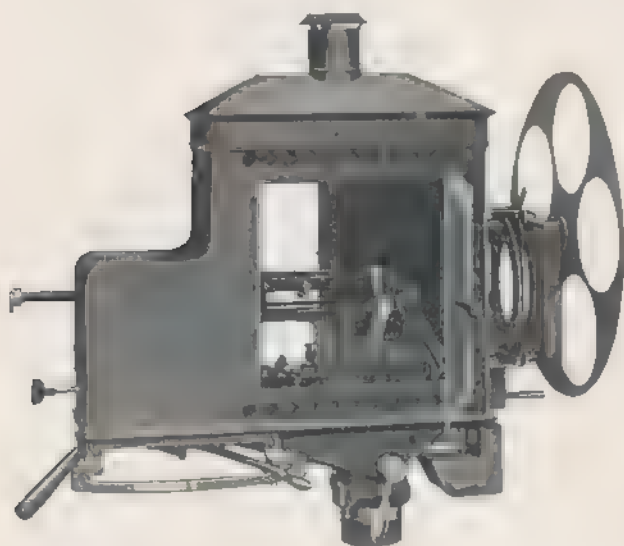


A compensating balancing device secures perfect balance, regardless of the position of the lamp in the lamphouse. The entire weight of the lamp and lamphouse is carried on Norma ball bearings so that the movements on the stage can be followed with the utmost ease and without the jerky effects commonly seen with the ordinary spotlight. The control handles at the rear of the lamphouse are fastened to telescoping tubes, thereby eliminating the annoying feature of long rods projecting thru the rear of lamphouse when lamp is in extreme rear position.

Power's Type "E" Spotlight is equipped with the Power's Type "E" Lamp which is fully described in another part of this book. The very great superiority of the Type "E" equipment has been fully demonstrated in connection with Power's Projectors and is a strong evidence of the care taken in designing and building Power's Type "E" Spotlight.

One Iris dissolver, two lens holders for 6 and 8" lenses and a color wheel with 5 openings are included as regular equipment for each Type "E" Spotlight.

### *Power's "G-E" High Intensity Spotlight*



**O**WING to the quality and intensity of the illumination developed by the Power's "G-E" High Intensity Arc Lamps, Power's "G-E" High Intensity Spotlight is particularly suitable for theatres requiring an exceptionally strong flood and a brilliant spot.

The lamphouse of Power's "G-E" High Intensity Spotlight has been constructed to accommodate Power's "G-E" High Intensity Arc Lamp but in all other details this spotlight is exactly the same as Power's Type "E" Spotlight.

The superiority of Power's "G-E" High Intensity Spotlight is also due to the excellent mechanical features of Power's "G-E" High Intensity Arc Lamp described on pages 24, 25 and 26 of this catalog. This equipment is supplied for any of the current ratings referred to on page 26.

*Power's Dissolving Stereopticon*



THE ORDINARY stereopticon attachment was adequate at a period when much lower amperage was used in motion picture theatres and audiences less exacting. Power's Dissolving Stereopticon can be used to secure unusual slide effects which greatly add to the variety and attractiveness of the performance.

Power's Dissolving Stereopticon consists of two single stereopticons, one above the other, each equipped with an iris diaphragm so connected that one opens as the other closes. Perfect synchronization of these movements and correct registration of the lenses assure the proper dissolving effect. The dissolving stereopticon gives a much

## NICHOLAS POWER COMPANY, Incorporated

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more pleasing effect than the single stereopticon, and in addition to this the projectionist avoids the jerky effect caused by abruptly removing the slide from the slide-holder.

Power's Dissolving Stereopticon permits the use of correct amperage and thus effects a considerable saving in the cost of current consumption. The amperage required for the showing of films is far in excess of that required for slides, and the heat thus created greatly increases slide breakage. The convenience of the projectionist and the use of proper lenses for stereopticon work are further advantages gained through the use of Power's Dissolving Stereopticon. The apparatus can be easily handled and placed for operation, and the telescoping legs permit ample adjustment. The stand is of light, but substantial, seamless tubing. A shelf having a tilting universal joint is placed on the front leg and can be set horizontally regardless of the position of the dissolver. This shelf which will hold a large sized slide box can be placed outside, across the front, or in any position desired for the convenience of the projectionist. The design and construction of Power's Dissolving Stereopticon Lamp and Lamphouse are of the same high standard established for Power's Projectors and accessories. Absolutely no inflammable material is used in this equipment. The lamp is substantially constructed, is easily adjustable, and handles on the outside of the lamphouse facilitate manipulation. The lamphouse is constructed to permit ready accessibility when cleaning and making adjustments, has ample ventilation, and meets all requirements of the National Board of Fire Underwriters.

The iris diaphragm dissolvers have a universal joint arrangement, and any desired adjustment can be secured. The projection lenses cannot get out of alignment. Telescoping tunnels are placed between the condensers and projection lenses, which prevent spread of light rays into projection room and auditorium. The lenses are of a high quality and will meet the most exacting conditions.

Incandescent equipment 1,000 Watt or T 20, 600 or 900 Watt 30 Volt Lamp can be supplied for Power's Dissolving Stereopticon. When the T 20, 600 or 900 watt 30 volts lamp is used for Power's Dissolving Stereopticon an Ammeter will be necessary as supplied for Power's "G-E" Incandescent Equipment, shown on page 28. When the Ammeter is ordered it will be mounted on a bracket bolted to the back of the lamphouse. It will also be necessary to use the Transformer shown on page 28, or Power's Automatic Transformer, illustrated on page 29.

The rheostat shown, while not sold as part of Power's Dissolving Stereopticon, is specially designed for use in connection with this equipment. It is composed of two separate adjustable rheostats combined in one casing to make the equipment more compact and save space.

## GENERAL INFORMATION

**P**OWER'S PROJECTORS ARE MADE IN OUR OWN FACTORY, believed to be the largest machine shops in the world devoted to the manufacture of standard, professional projectors. Bars or blanks of metal, scientifically made according to our specifications, come into our factory and leave as the finished Power's Products. Our shops are always open for inspection, and we will be very glad to show visitors thru at any time.

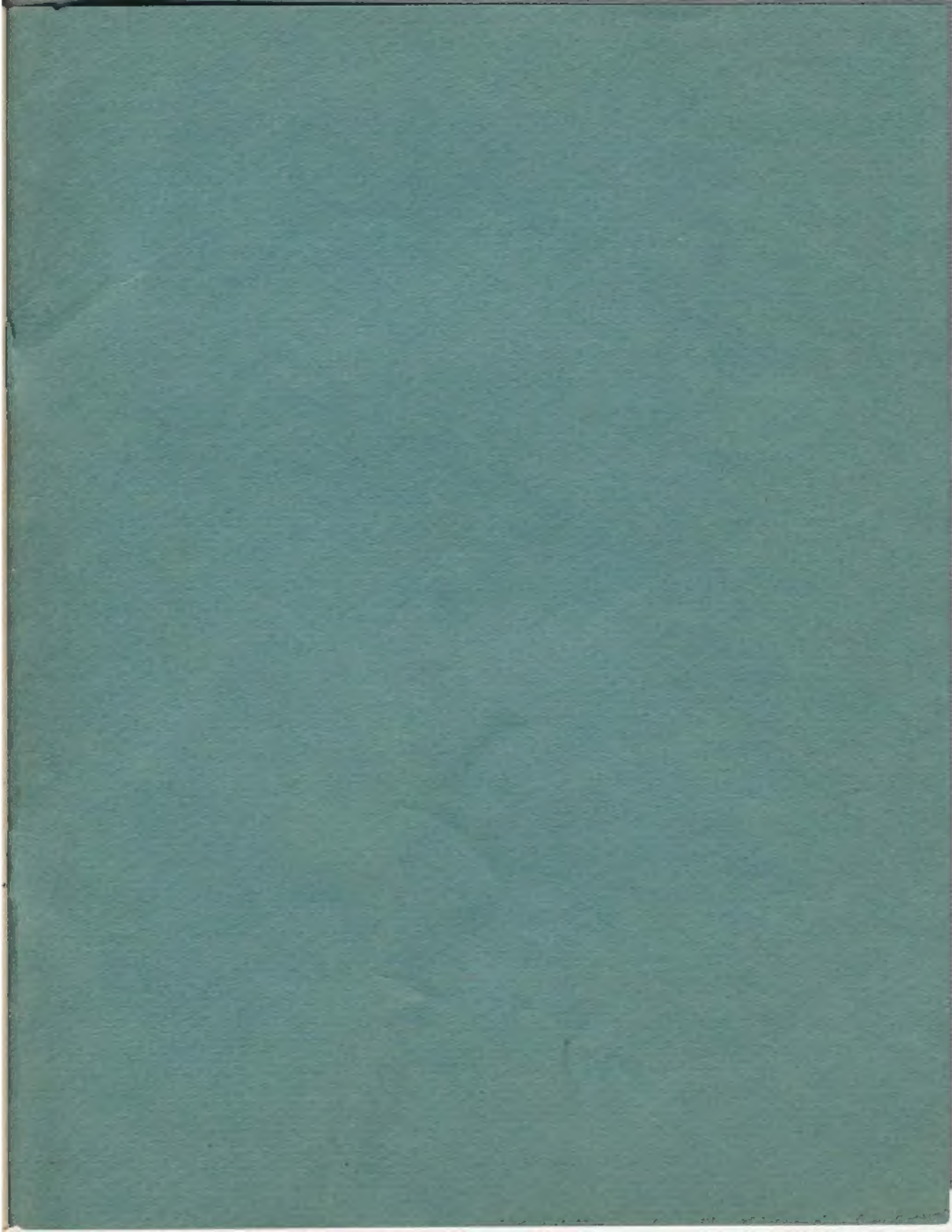
THE ELEMENT OF SERVICE IS AN IMPORTANT CONSIDERATION in the purchase of any machine, and Power's Projectors are sold thru authorized distributors in all parts of the United States and thruout the world. Our representatives are able to render prompt advice and assistance in emergencies, and upon request, we will be pleased to furnish you with the name of the Power's distributor in your locality.

NO MATTER WHERE POWER'S PROJECTORS ARE PURCHASED, WE ASSUME FULL RESPONSIBILITY FOR MATERIALS AND WORKMANSHIP. It is advisable to first use every possible means to get assistance or information from the local Power's representative, who will be glad to help users of Power's Projectors whenever necessary. If, for any reason, satisfactory results are not secured in this way, we ask you to write direct to the Company.

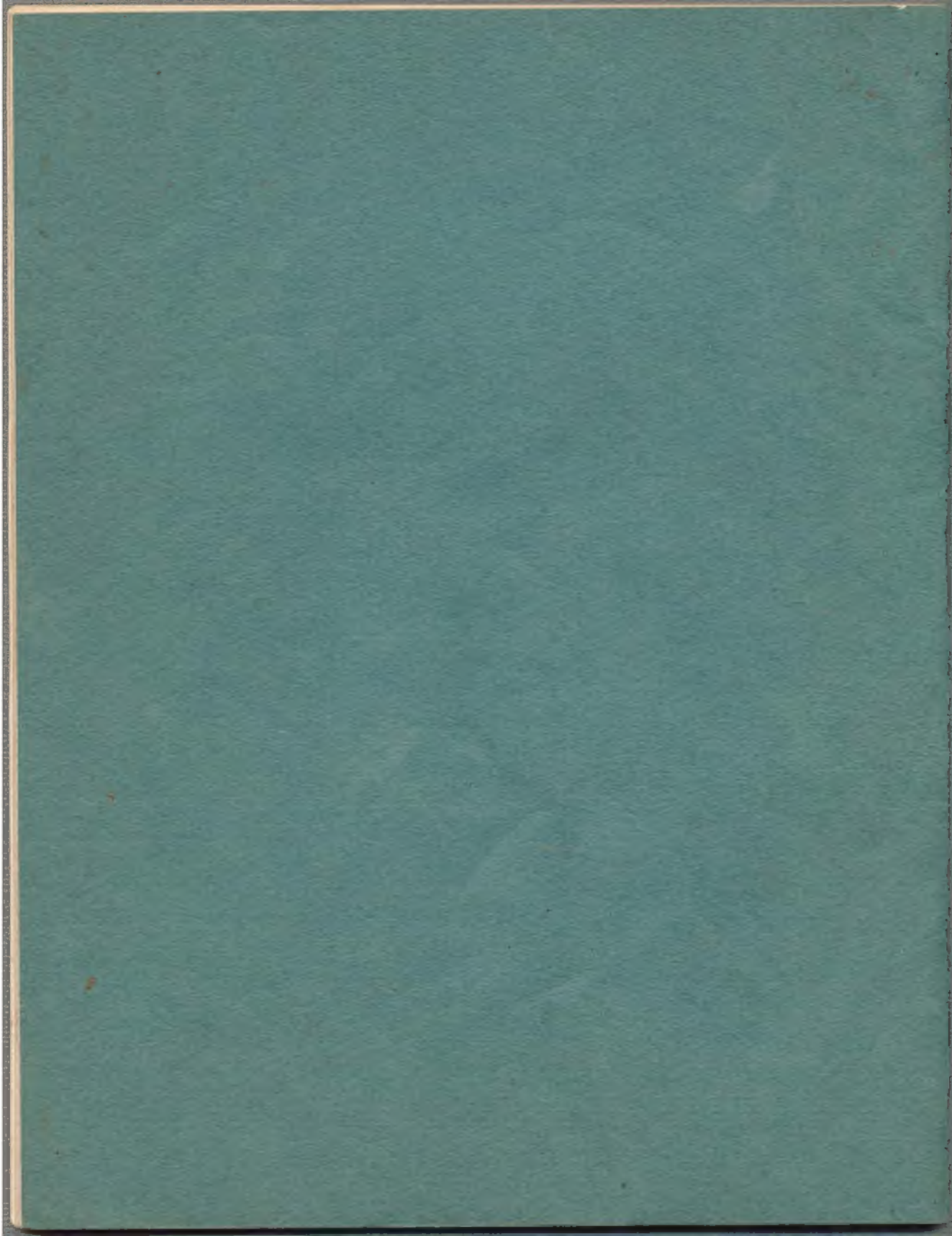
ALL QUESTIONS REGARDING PROJECTION SUBMITTED TO US will be given careful, practical and expert attention. Plans for projection room construction will be furnished to architects, owners or committees contemplating the erection of buildings to be used to show motion pictures. Whenever necessary, special drawings will be made, based upon measurements and details furnished by those requiring information.

"N.P. CO., INC." IS STAMPED ON ALL GENUINE POWER'S PARTS, and we strongly urge all those using Power's Projector's to avoid imitations. A little care in this direction will be of decided advantage to the man who operates the machine and may be a definite means of averting expensive troubles and breakdowns.











**Nicholas Power**